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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO
09/546,399	04/10/2000	Richard D. Hull	108949.101	2277

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EXAMINER

MORAN, MARJORIE A

ART UNIT PAPER NUMBER

1631

DATE MAILED: 04 02 2003

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/546,399

Applicant(s)

HULL ET AL.

Examiner

Marjorie A. Moran

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) 9-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 April 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4</u> . | 6) <input type="checkbox"/> Other: |

Election/Restrictions

Applicant's election of Group I, claims 1-8, in Paper No. 7, filed 2/13/03 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claims 9-21 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Invention, there being no allowable generic or linking claim. Election was made **without** traverse in Paper No. 7.

Priority

The instant specification claims benefit of Provisional Application 60/128,473, filed 4/9/1999. However, the disclosure of the Provisional Application fails to provide support for the limitations of elected claims 1-8 for the following reasons, therefore priority is not granted to the Provisional Application.

Instant claim 1 recites creating "at least one" chemical descriptor for each compound in a collection of compounds, recites representing "at least one" chemical descriptor as "at least one" vector comprising "at least one" descriptor frequency, recites representing (the collection? - see below) as a "first vector" of a molecule-descriptor matrix, recite producing "at least one" singular matrix, and recites transforming a chemical probe descriptor into a "first" coordinate system "at least substantially similar" to a "second" coordinate system.

The specification of the Provisional Application does not provide literal support for the steps of elected claims 1-8 of the instant application. The Provisional Application does disclose claims similar to those of the instant application; however, claim 1 of the Provisional Application recites creating chemical descriptors (plural) for each compound in a collection of compounds; recites representing the descriptors (plural) *for a given compound* as a (singular) vector of *unique* descriptor *frequencies*. It is noted that the vector of the Provisional Application does not *comprise* the descriptor frequencies; it is further noted that vectors are usually recognized in the art as representing properties rather than comprising them. Claim 1 of the Provisional Application further recites representing the collection of compound vectors (plural) AS the *column* vectors (plural) of a molecule-descriptor matrix, recites producing singular matrices (plural), and recites transforming descriptors (plural) of probe compounds (plural) into the SAME coordinate system as the compounds in the collection.

The phrase "at least one" recited in the elected claims includes one or a single entity whereas the Provisional Application recites plural entities only, therefore the Provisional Application fails to provide support for creation of a single chemical descriptor, for representation of a single chemical descriptor as a vector which comprises (as opposed to represents) only one descriptor frequency, for generation of a single chemical probe descriptor, or for production of a single singular matrix.. The Provisional Application further fails to provide support for representing (a collection?) of a single vector as a FIRST vector of a molecule-descriptor matrix, or for two different coordinate systems, much less one which is "at least substantially similar" to another. It

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is noted that the specification of both the instant application and the Provisional Application make it clear that the coordinate system used for a collection and for a probe must be the SAME in order for a comparison to be successfully carried out. See the lack of enablement rejection below.

As the Provisional Application fails to provide support for the limitations of at least instant claim 1, and claims 2-8 depend from claim 1, elected claims 1-8 are not granted benefit of the filing date of the Provisional Application, and are granted priority only to the filing date of the instant application, of 4/10/2000.

Claim Objections

Claim 1 is objected to because of the following informalities: the term "frequencies" in step (b) should be --frequency--. Appropriate correction is required.

Claim Rejections - 35 USC § 112, First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a LACK OF WRITTEN DESCRIPTION rejection.

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The specification fails to provide support for the elected claims as follows:

Instant claim 1 recites creating “at least one” chemical descriptor for each compound in a collection of compounds, recites representing “at least one” chemical descriptor as “at least one” vector comprising “at least one” descriptor frequency, recites representing (the collection? - see below) as a “first vector” of a molecule-descriptor matrix, recite producing “at least one” singular matrix, and recites transforming a chemical probe descriptor into a “first” coordinate system “at least substantially similar” to a “second” coordinate system.

The instant specification provides support for a method similar to that claimed, on pages 7-8; however, the specification discloses a method wherein multiple chemical descriptors are created for each compound in a collection, the plural descriptors for a given compound are represented as a vector of *unique* descriptor frequencies (plural), and the collection of vectors (not compounds or a single vector) is represented as the *column* (NOT “single”) vectors of a molecule-descriptor matrix. Further, the specification, on page 8, discloses a step of performing singular value decomposition to produce plural singular matrices, discloses generation or creation of plural chemical descriptors for probe compounds, and discloses that the descriptors for the probed compounds be transformed into THE SAME coordinate system as that for the compounds in the collection. The specification also exemplifies a method of comparing a probe compound to another (set) of chemical compounds, on pages 21-22. Again, the specification discloses only generation of multiple descriptors for each compound in the collection, and on page 27 discloses generation of multiple column vectors for each

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compound. According to pages 27-32, in order to compare a probe to compounds in the collection, the probe must be projected as a "pseudo object" into the matrix generated from vectors representing the collection; i.e. the coordinate system for the probe MUST be the SAME as that for the compounds to which the probe is compared. There is no support anywhere in the specification for two coordinate systems, specifically ones which are not the same. It is noted that the limitation in instant claim 1 for a "first" and "second" coordinate systems which are "at least substantially similar" makes it clear that applicant intends (a) TWO coordinate systems, and (b) coordinate systems which may be different from each other.

For the reasons set forth above, claim 1, and claims 2-8, as they depend from claim 1, are rejected for lack of written description.

Claim 2 recites generating descriptors from "chemical connection tables". The specification, on page 8, recites the phrase "chemical connection tables" but does not further identify or describe such tables. The specification, on pages 21-22, discloses that each compound in a created database is represented by a data structure called a "connection table", and teaches that chemical descriptors may be generated from such a table, but again does not describe or otherwise identify a "connection table".

As the specification does not fully and completely describe a "connection table", claim 2 is rejected for lack of written description.

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Claim 8 recites use of an "identity matrix I". The specification recites the phrase "identity matrix I" on page 9, but does not otherwise identify or describe such a matrix. The specification further discloses that "the identity matrix I" may be used in place of Σ_K to calculate similarities, but again does not describe or exemplify an "identity matrix I".

As the specification does not fully and completely describe an "identity matrix I", claim 8 is rejected for lack of written description.

Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method wherein the chemical descriptors for a probe are transformed into a coordinate system which is the same as that for a collection of compounds such that the probe can be compared to compounds in the collection, does not reasonably provide enablement for a similar method wherein the coordinate systems are different. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. THIS IS A LACK OF ENABLEMENT rejection.

The factors to be considered in determining what constitutes undue experimentation were affirmed by the court in *In re Wands* (8 USPQ2d 1400 (CAFC 1986)). These factors are the quantity of experimentation; the amount of direction or guidance presented in the specification; the presence or absence of working examples; the nature of the invention; the state of the prior art; the level of skill of those in the art; predictability or unpredictability of the art; and the breadth of the claims.

The claims are enabled for a method wherein the wherein the chemical descriptors for a probe are transformed into a coordinate system which is the same as

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that for a collection of compounds because the specification teaches how to compare a probe to a collection using such a method step; however, the claims are not enabled for a method wherein different the coordinate system for a probe is different from that of a collection because neither the specification nor the prior art teach how to compare chemical compounds using different coordinate systems.

The specification discloses, on page 8, a method wherein the “descriptors of probe compounds are transformed into the same coordinate system as the compounds in the collection” and exemplifies, on pages 28-30, a method wherein a matrix is generated using descriptors from a set of known compounds (a collection), then a query object (representing a probe compound) is projected into the matrix for comparison. As the same matrix is used, the coordinate system for the query object and the collection must be the same. The specification does not teach or exemplify any method wherein probe descriptors are transformed into a coordinate system different from that of a comparative collection. The state of the prior art is such that methods of using matrices and coordinate systems to compare similarities between data items/structures taught by DEERWESTER (US 5,778,362). However, DEERWESTER teaches comparison of vectors within a single matrix (col's 6-7). Neither the specification nor the prior art teach how to determine the similarity of chemical structures which are transformed into different coordinate systems. The level of skill in the art is acknowledged to be high; however, given the lack of guidance in either the specification or the prior art for how to do so, it would require undue experimentation to determine how to compare structures using two different coordinate systems. For these reasons, the claims are not enabled

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for a method wherein the coordinate system for a probe is not the same as that of a collection of compounds.

Claim Rejections - 35 USC § 112, Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites "another chemical compound" in line 3. It is unclear if this phrase is intended to limit the chemical probe to comprise a chemical compound different from the "at least one chemical compound" of lines 1-2, or is intended to limit the probe to comprise at least two compounds (i.e. a first compound and "another chemical compound"), therefore the claim is indefinite.

Step (c) of claim 1 recites "the collection of compound the at least one vector" which is a nonsensical phrase and has no antecedent basis. As step (b) of claim 1 recites representing at least one chemical descriptor as at least one vector, the claim will be interpreted as if it recited --representing the at least one vector as a first vector--.

Step (g) of claim 1 recites the phrase "transformed probes". It is unclear whether the "transformed probes" are the same as the "at least one chemical probe" of earlier steps, therefore the claim is indefinite.

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Step (h) of claim 1 recite "at least one probe". It is unclear whether the "at least one probe" is the transformed probe of step (g), or the "at least one chemical probe" of the preamble and earlier steps, therefore the claim is indefinite.

Claim 2 recites "chemical connection tables" inline 3. Such tables are not fully described by the instant specification, as set forth above. Chemical connection tables for various compounds are known in the art; however, it is not clear that the tables of the prior art are intended to be the same as those claimed. Further, one skilled in the art would not know the metes and bounds intended by applicant for "chemical connection tables", therefore the claim is indefinite.

Claims 2 and 3 limit a step of creating at least one descriptor. It is unclear whether the step limited is step (a) of claim 1 for creating a chemical descriptor or step (e) for creating a chemical probe descriptor, or both, therefore the claim is indefinite.

Claim 4 recites "said step of calculating the similarity between pseudo-object..." in the last paragraph of the claim. Parent claim 1 does not recite any step of calculating a similarity to a pseudo-object, therefore the antecedent basis for the phrase, and the step intended to be limited are unclear.

Claim 4 recites "each normalized row of P_k " in the last lines of the claim. However, P is defined earlier in the claim as a singular matrix, therefore it is unclear whether P is intended to represent a matrix or a row within the matrix, or a row after normalization. As the limitation intended by P and/or P_k is unclear, the claim is indefinite.

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Claim 5 recites "each pair of vectors" in lines 2-3. Parent claim 4 does not recite pairs of vectors. Parent claim 1 recites several vectors, specifically in steps (b) and (c), but does not recite pairs of vectors. The similarity calculating step 9g) of claim 1 does not recite vectors at all. As it is unclear what "pair of vectors" is to be used for calculating similarity, claim 5 is indefinite.

Claim 8 recites "using an identity matrix I". An "identity matrix I" is not described or exemplified by the instant specification, as set forth above. As one skilled in the art would not know the metes and bounds of an "identity matrix I", the claim is indefinite. Further, it is unclear what step is intended by "using" the identity matrix I, therefore the claim is further indefinite.

Conclusion

No claims are allowed.

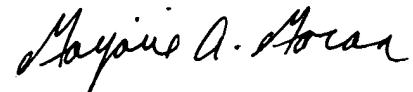
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marjorie A. Moran whose telephone number is (703) 305-2363. The examiner can normally be reached on Monday to Friday, 7:30 am to 4 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward can be reached on (703) 308-4028. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-4242 for regular communications and (703) 872-9306 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3524.

MARJORIE MORAN
PATENT EXAMINER

A handwritten signature in cursive script that reads "Marjorie A. Moran".

mam
April 1, 2003